Sir Wm.) Schlich was Inspector General of Forests. He succeeded in obtaining the sanction of the Government of India and of the Secretary of State for India to the establishment of the working-plan branch of the department. Under the regulations then issued, all working plans had to be submitted to the Inspector General, who examined them and communicated his views on them to local governments. The Imperial Superintendent of Working Plans kept a record of the progress of the work by means of annual returns submitted to him by local authorities. In this way, a great store of statistics was collected, which, according to Sir Wm. Schlich's intentions, were to be made available as the work proceeded. Unfortunately, after his departure from India in 1885, little or nothing was done in this respect for about fifteen years.

A fresh move was commenced about the year 1901, when Mr. R. C. Wroughton, then Inspector General of Forests, conceived the idea of the present Forest Research Institute, which was approved by the Government of India. The installation of the institute was, however, carried out by his successor, Mr. J. Eardley Wilmot. It is stationed at Dehra Dun, and consists of six members, namely :—(1) a president, (2) an imperial superintendent of forest working plans, and sylviculturist, (3) a forest zoologist, (4) a forest botanist, (5) a forest economist, and (6) a forest chemist.

Arrangements were made for the publication of (1) Indian forest records, and (2) Indian forest memoirs. The latter are published as quarto volumes measuring 12¼ inches by 10 inches, this being the size used by the Royal Asiatic Society and the Geological Survey of India.

The volume under review is the first number of the economic product series. It is a stately but very unwieldy volume, of 273 pages text, and 218 pages of appendices. It is divided into part i., the various uses of Indian woods according to the different purposes for which wood is used; and part ii., descriptive list of the chief Indian woods.

The indices are two in number, giving (1) the English and trade names, and (2) vernacular names.

As part i. is divided into thirty-four sections, such as agricultural implements, boat and ship building, coopers' work, furniture, mining timber, ordnance work, railway carriages, sleepers, telegraph poles, tools, toys, wood pulp, &c., it follows that many woods are mentioned under a considerable number of sections.

Part ii. deals with each species under a number of heads, such as natural order, synonyms, English name, vernacular names, habitat, description of tree and wood, weight per cubic foot, strength, and chief uses. Under the last head, all that has been said in part i. is here repeated. The list of woods is arranged alphabetically to facilitate reference. The number of species dealt with is 554, or about 10 per cent. of some 5000 woody species, about half of which are trees. The descriptions are based mainly on those in Gamble's "Manual of Indian Timbers," supplemented by the results of a further examination of many species. To ascertain what proportion the latter bear to the former would require a detailed comparison of the two works.

The appendices are no doubt very useful, but they are contained in Gamble's book in far more concise shape, while they are spread over 218 pages in the work under review. Indeed, there is in the latter quite an inexcusable waste of space, which reduces the usefulness of the index of vernacular names considerably; it might have been condensed to one-quarter the space. We believe the work was compiled for the use of firms. If this is so, why was the information, if wanted at all, not brought out in a handy little booklet instead of in this big quarto volume, which requires a table of its own to spread it out upon? For the shape, however, Mr. Troup is not responsible; that was laid down by official orders, which the author would have done well to resist.

The present is the second work published by Mr. Troup, the first being a volume on Indian forest utilisation. Both are, to a considerable extent, compilations. We admire Mr. Troup's remarkable activity, but we hope that his transfer to the post of imperial working-plans officer and sylviculturist will enable him to devote his energy to more fruitful work. The most urgent need is the study of the sylvicultural bearing of the more important Indian timber trees. Gamble's "Manual of Indian Timbers" gives all that is required regarding timbers and their uses, until other branches of forestry have been brought up to the same level.

OUR BOOK SHELF.

A Survey and Record of Woolwich and West Kent. General editors, C. H. Grinling, T. A. Ingram, and the late B. C. Polkinghorne. Pp. viii+526. (Woolwich: Labour Representation Printing Co., Ltd., 1909.) Price 10*s*. 6*d*.

THE publication of this work, originally intended for the Woolwich Congress (1907) of the South-eastern Union of Scientific Societies, has been delayed owing to alterations found desirable in the original scheme, and to the regretted death of one of the editors and the prolonged ill-health of another. As it now appears, it is a valuable contribution to our knowledge of that portion of Kent bounded by the Thames, the Ravensbourne, the Cray, and the outcrop of the chalk between the two last-named rivers. It is, moreover, an excellent example of the beneficial result of cooperation in scientific work, for here we have brought together, in readily accessible form, records of the work of local scientific societies and isolated naturalists. The result, so far as numerical records are concerned, will doubtless be astonishing to many. From a small corner of Kent, only some fifty to sixty square miles in area, a considerable portion within the London postal district, none beyond what might be regarded as the outer suburban zone, a rich flora and fauna are recorded. Of plants there is a list of more than 2000. The number of animal forms is not summarised, but the records, with citations of localities, occupy just over 200 pages; of Coleoptera or beetles no less than 3264 species are enumerated.

The publication of these records will doubtless, as the authors hope, induce others to contribute additions either to the lists of species or of localities, and thus to secure fuller knowledge of the distribution of the organisms. Rapid changes, due to the incursions of man, are taking place within the area, and in a few years' time the records will have an added value in enabling us to trace actual changes, and also, perhaps, some of the causes determining those changes. Almost everyone interested in natural history makes

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from time to time observations, of minor importance, perhaps, regarded as isolated facts, but valuable if brought together and studied in relation to those of other observers in the neighbourhood. Not the least service rendered by a volume such as this is that it offers a definite place of record for many a fact which would otherwise probably be lost. We have discussed at some length the biological matters, which occupy about four-fifths of the book. In addition, there is a brief general sketch of the geology, in which, as an instance of interrelation between geology and industry, it may be noted that Woolwich Arsenal is said to owe its establishment to the suitability of the local Thanet sands for iron-moulding. Scientific industries and archæology are other interesting chapters, and there is a concluding note on Woolwich as a centre for photography. The geological section has a very useful bibliography, arranged chronologically. The book is well indexed. W. G. F.

The Flora of the Dutch West Indian Islands. Vol. I., *St. Eustatius, Saba, and St. Martin.* By J. Boldingh. Pp. xii+321. (Leyden: late E. J. Brill, Ltd., 1909.) Price 10*s.*

CONSIDERING the comparative proximity of the West Indies and the number of nationalities in possession, there is a lack of systematic botanical information in the shape of local floras, so that Mr. Boldingh renders good service by the publication of his work relating to three of the Dutch possessions. It is based primarily on his own observations and collections, together with the collections of his countrymen, Dr. Suringar, Mrs. van Grol-Meyer, and Dr. Lionarons, totalling in all about 5000 numbers. The systematic enumeration comprises 806 species, of which 674 are regarded as indigenous and 166 are confined to the West Indies. The Leguminosæ is the best represented family, with sixty species; the Gramineæ, Compositæ, Polypodiaceæ, and Euphorbiaceæ follow in the order named. Panicum, Polypodium, and Peperomia are the larger genera. Ipomœa supplies nine species, of which two are limited to the West Indies, and another is recorded only for St. Eustatius. Two other endemic species, *Galactia nummularia* and *Calyptranthes Boldinghii,* have only been collected on St. Martin.

The author follows Eggers in the ecological divisions, and distinguishes littoral, cultivated, dry shrubby or Croton, and tree or Eriodendron types of vegetation. The dry shrubby and tree vegetations are well developed on St. Eustatius; on Saba the cultivated regions and certain ferns are notable; St. Martin is characterised by the extent of the littoral and shrubby vegetations, while forests are scanty. Generally speaking, the flora of St. Martin differs from that of the other two islands, and contains a number of plants represented on islands lying to the north, while the proportion stands the other way with regard to certain plants recorded only from islands lying to the south. The author has rounded off his information with geological and meteorological notes, a list of vernacular names, chiefly English, and maps. The flora bears out the general view that there is no striking difference between the plants of neighbouring islands in the group.

Weather Forecasting by Simple Methods. By F. S. Granger. Pp. xii+121. (Nottingham: Henry B. Saxton, 1909.) Price 2*s.* 6*d.* net.

THE aim of the author is to provide the means for a single observer "to answer the question 'When will it rain?' in a simple and intelligible manner" without the aid of instruments except a barometer, this, however, being regarded as optional, and not necessary. The methods recommended are based mainly on observations of the size, thickness, extent, height, colours, and forms of clouds. Different aspects of cumulus, cirrus, and stratus cloud are discussed in relation to the weather to be subsequently expected, and isolated examples taken from the author's observations at Nottingham are quoted.

As the result of a long series of observations by an observer who is evidently interested in the subject, the work may prove useful to local observers, but it is doubtful to what extent some of the conclusions arrived at can be considered general. Thus "visibility" is regarded as a sign of good weather, because this phenomenon occurs at Nottingham only during light easterly breezes. In some districts, however, visibility is frequently associated with winds from some westerly point, and is commonly supposed to be a prognostic of rain.

Although Mr. Granger again tells us that meteorology is not an exact but an observational *science,* he says in the same breath that his book is not written on exact and *scientific* lines. He has described it well. His cloud classification is incomplete, and is not that approved by international agreement. He ascribes the formation of cumulus to an electrical cause, and states that lurid red skies in the morning or evening are due to refraction of light. After using the word "gradient" several times he at length defines it as "the slope between two isobars when on one the barometer is one-tenth of an inch higher than the other," and speaks of a gradient of 300 miles, a gradient of 29·9, a shallow gradient, and a form of gradients. There are many other statements which ought to be modified in the light of recent researches. For example, our knowledge of the conditions in the free atmosphere is not as limited as the author suggests, and surely calculation already enters into the science of forecasting, and must continue to do so to an increasing extent.

The arrangement of the work, especially with regard to marshalling the descriptions under some definite plan and arranging them in chapters with appropriate headings, leaves much to be desired. The present arrangement is almost fortuitous.

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts intended for this or any other part of* NATURE. *No notice is taken of anonymous communications.*]

The Invention of the Slide Rule.

I HAVE read with great interest the abstract of the paper on the invention of the slide rule, by Prof. F. Cajori, which appeared in NATURE of December 30, 1909. I agree with the author in thinking that the Rev. William Oughtred was the first to suggest that calculations could be made more accurately and rapidly by sliding the edges of logarithmic scales together than by using compasses —the method adopted by Gunter; but Oughtred had a poor opinion of this device, and rightly considered that his circular scale was a great improvement on it. A few years before 1671, Seth Partridge[1] re-discovered the sliding principle, perfected it, and gave an almost complete specification for the slide rule which is used to-day by engineers.

I was fortunate enough recently to come across, in the library of the British Museum, a pamphlet written by Oughtred in reply to an attack make on him by an instrument maker called Delamain. The pamphlet is entitled "To the English Gentrie and all other studious of the Mathematicks, which shall be readers hereof. The just apologie of Wil: Oughtred against the slanderous insimulations of Richard Delamain, in a pamphlet called Grammelogia, or the Mathematicall Ring." The author very forcibly and very successfully rebuts the charges that were made against him. The following gives his opinion on the question of the priority of the discovery of the circles of proportion:—

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[1] "The Description and Use of an Instrument called the Double Scale of Proportion." (London, 1671.)

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